

SuperPave Bulletin No. 1

SuperPave for low volume roads.

This bulletin was developed to provide guidance to local agencies on the use of the SuperPave system for hot mix asphalt mixtures.

The Iowa D.O.T. is on schedule for full implementation of the SuperPave system for hot mix asphalt mixture design on the primary system by the year 2000. Implementation for local agencies is tentatively scheduled for 2002. Recent changes to the specifications should allow the application of SuperPave technology to lower volume routes using locally available aggregates.

The original specifications required the combined gradation to avoid the restricted zone; this often caused the mixtures to contain twice as much coarse aggregate as previous mixtures from the same sources. The initial compaction characteristics in the gyratory compactor were also originally set the same for all traffic levels; this caused most mixtures to require 80% or more crushed particles. The new supplemental specification SS-97038 waives the restricted zone requirement for nonprimary routes and adopts the changes to the initial compaction requirements. These changes are expected to allow the use of mixtures similar to those used in the past on local routes. Several points require clarification, however, before, local agencies can take full advantage of the SuperPave technology.

Mixture size designations are not the same as those used under the Marshall system. The definition of nominal maximum size is employed in the SuperPave specifications. SuperPave mixtures of the same size designation are coarser than their Marshall counterparts. Consideration should be given to reducing the mixture size designated by one sieve size when specifying a SuperPave mixture, for example, from 3/4" Marshall to V2" SuperPave. The availability of proper sized local materials must be part of this decision.

Lift thickness must also be considered in relationship to mixture size. In the past it has been common to place a 3/4" Marshall mixture in an 1 1/2" lift. Consideration should be given to using a figure of approximately three times the nominal maximum size as the minimum lift thickness. For an 1 1/2" lift, the mixture size should not exceed V2" using this "rule of thumb". Conversely, if a 3/4" mixture is desired, then the minimum lift thickness should be 2 1/4".

Many local agencies do not have reliable traffic data on their routes. The SuperPave system is designed to adjust for different traffic loads in the mixture design process, so traffic loads must be given to the contractor. Most local routes are low volume and can be specified as the lowest traffic level (less than 300,000 ESALs) in the SuperPave system without significant risk. Some engineering judgment must be applied, however. -Haul **roads near an elevator, quarry, pit** or factory, and urban connectors that carry substantial heavy loads may need to be designated as carrying ESALs higher than 300,000. Anytime a higher design ESAL level is specified, the mix design criteria increase and may require material and/or source changes.

Asphalt binder selection is now based on local climate conditions and traffic loading. To avoid confusion and help producers plan production, the Iowa D.O.T. Office of Materials reviewed the climate data for Iowa and selected PG 58-28 as the standard paving grade of asphalt binder. PG 58-28 provides the low temperature flexibility of AC-5 while maintaining the high temperature stiffness of AC-10. For very high traffic, or for slow moving heavy traffic, the high temperature grade is often bumped up one or two grades. For example PG 64-22 is used for Interstate overlays. PG 58-28 is appropriate for most uses, but there is now more flexibility in the binder selection system to adjust for special situations. When considering specifying a grade other than PG 58-28 for a special situation, it is recommended that the local agency consult with the Transportation Center Materials Engineer for guidance.

Quality Management - Asphalt (QMA) is an important part of the SuperPave system. The advances in technology in both the production and testing of asphalt mixtures in recent years has brought focus to the need for proper quality control. With the high production rates available today, only the contractor can provide the timely data needed to properly control the mixture. It should not be acceptable to place several miles of pavement before test results are available to confirm the quality of the mixture, or worse, to indicate a problem. Superpave mix designs have demonstrated a greater sensitivity to small variations than previous designs, therefore, it is recommended that QMA always be used in conjunction with the Superpave system.